



NASA Space & Earth

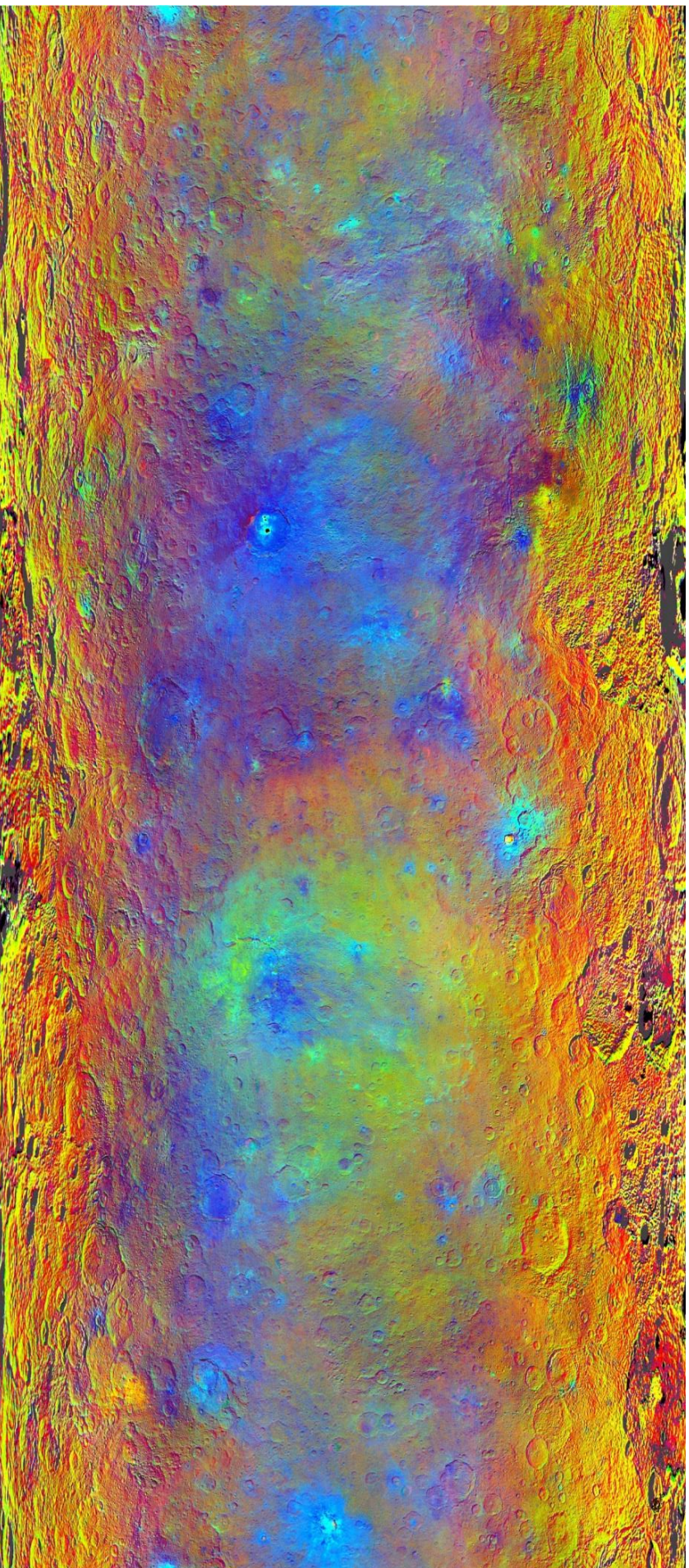
Dwarf Planet Images:

Ceres and Pluto

Print these images and ask students to select one they would like to draw.

**Students should feel free to interpret their image by cropping it or altering the colors.
Encourage students to pay attention to the elements of art as they draw and think
about the stories the surface features are revealing.**

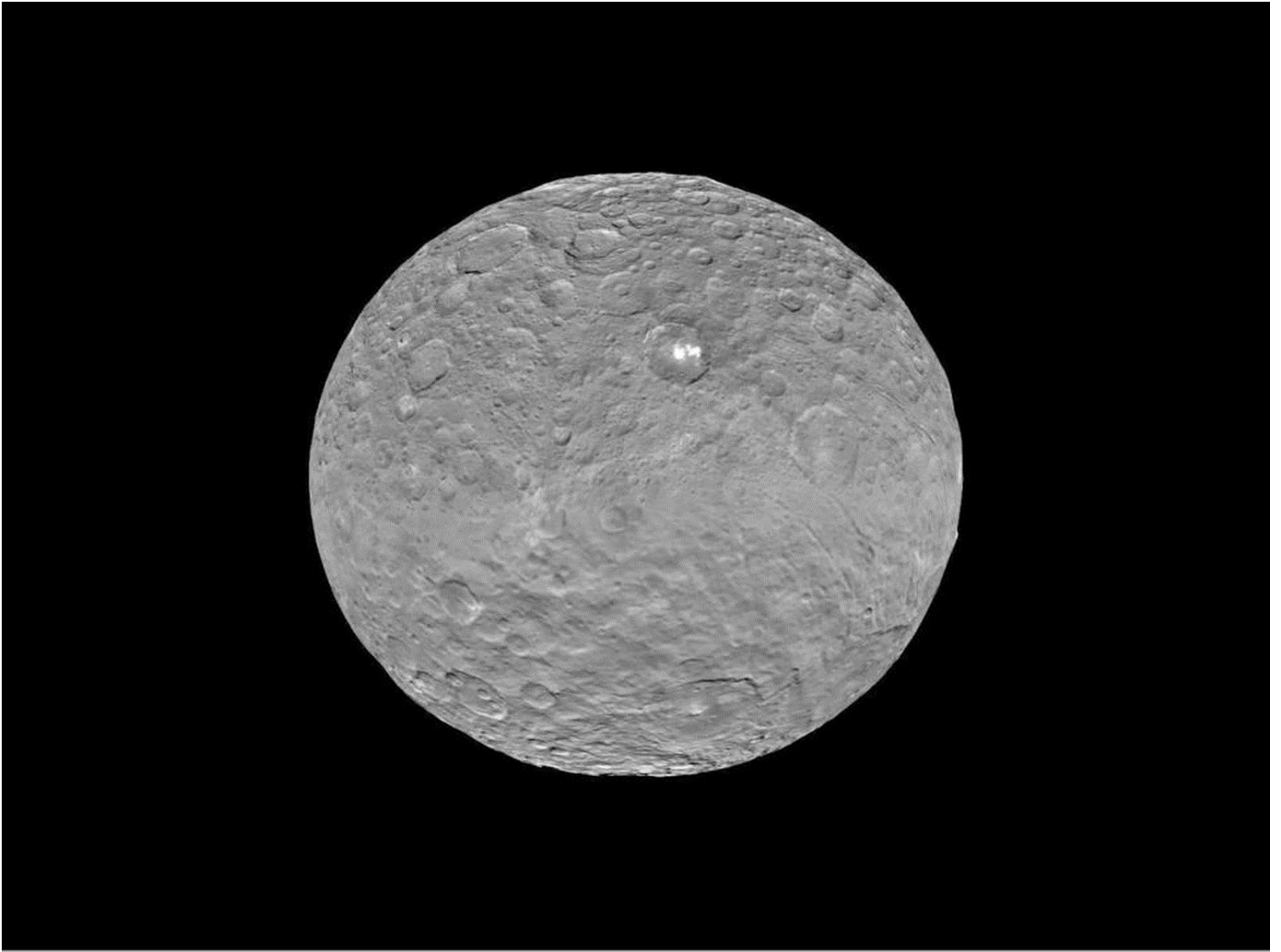
**(Laminating or putting the printed images in sheet protectors will help them
to last for multiple uses.)**



Hints at Ceres' Composition

This map-projected view of Ceres using infrared (920 nanometers), red (750 nanometers) and blue (440 nanometers) filters were combined to create this false color view taken by NASA's Dawn spacecraft during its High-Altitude Mapping Orbit (HAMO) in August/September, 2015.

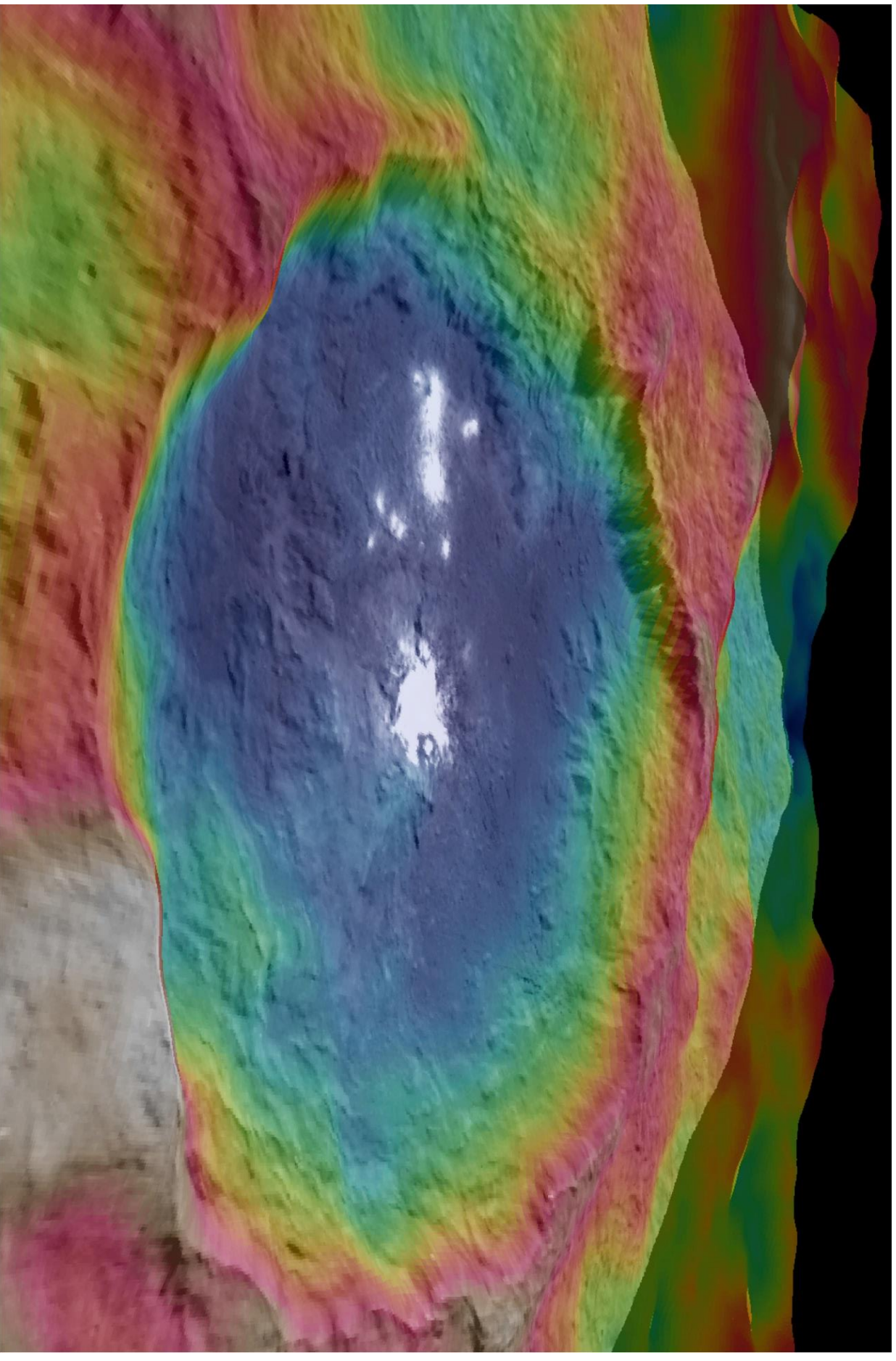
Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



Global View of Ceres' Bright Spots

Ceres is a mysterious world of rock and ice. The two bright spots reflect more sunlight than the rest of the surface material. In an effort to discover the real nature of the “bright spots,” The Dawn spacecraft is gathering more data from lower altitude orbits.

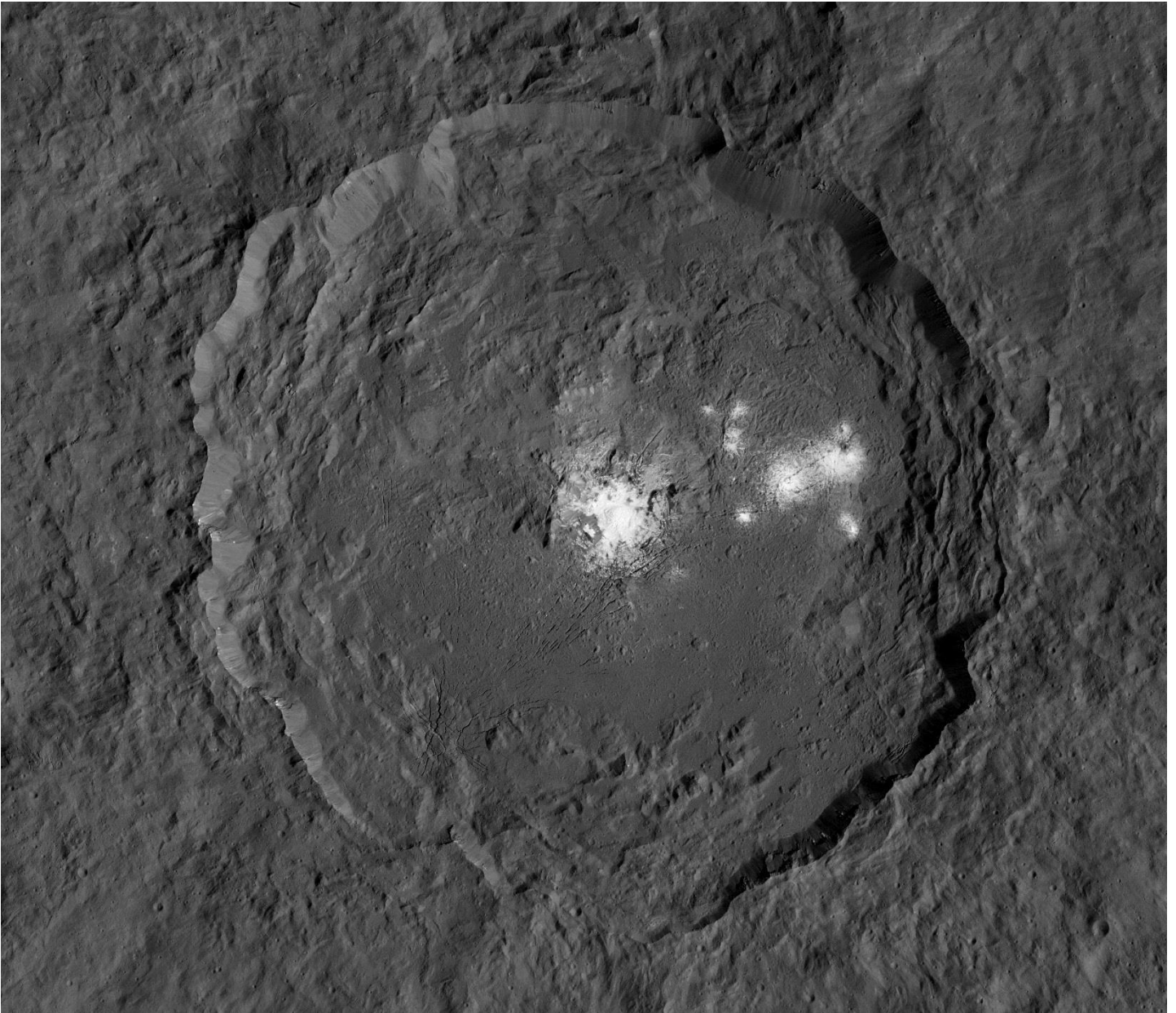
Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



Occator Topography

This view, made using images taken by NASA's Dawn spacecraft, is a color-coded topographic map of Occator crater, home to the brightest spots on Ceres. Blue is the lowest elevation, and brown is the highest on this 60 miles wide (90 kilometers), two miles (3.3 kilometers) deep crater.

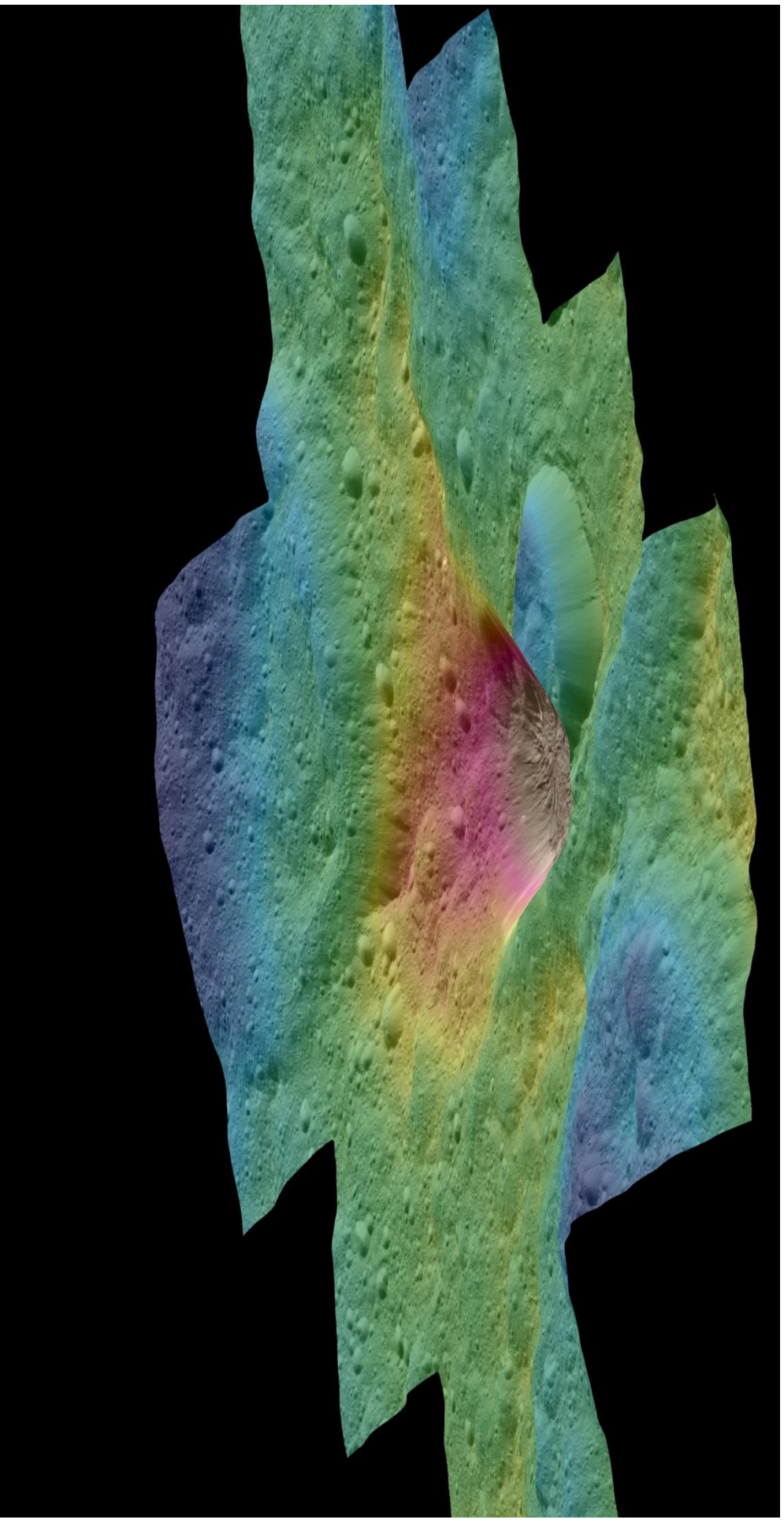
Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



Dawn Takes a Closer Look at Occator

This view is a mosaic of images of Occator. All images were obtained by the Dawn spacecraft during the mission's Low Altitude Mapping Orbit (LAMO) phase.

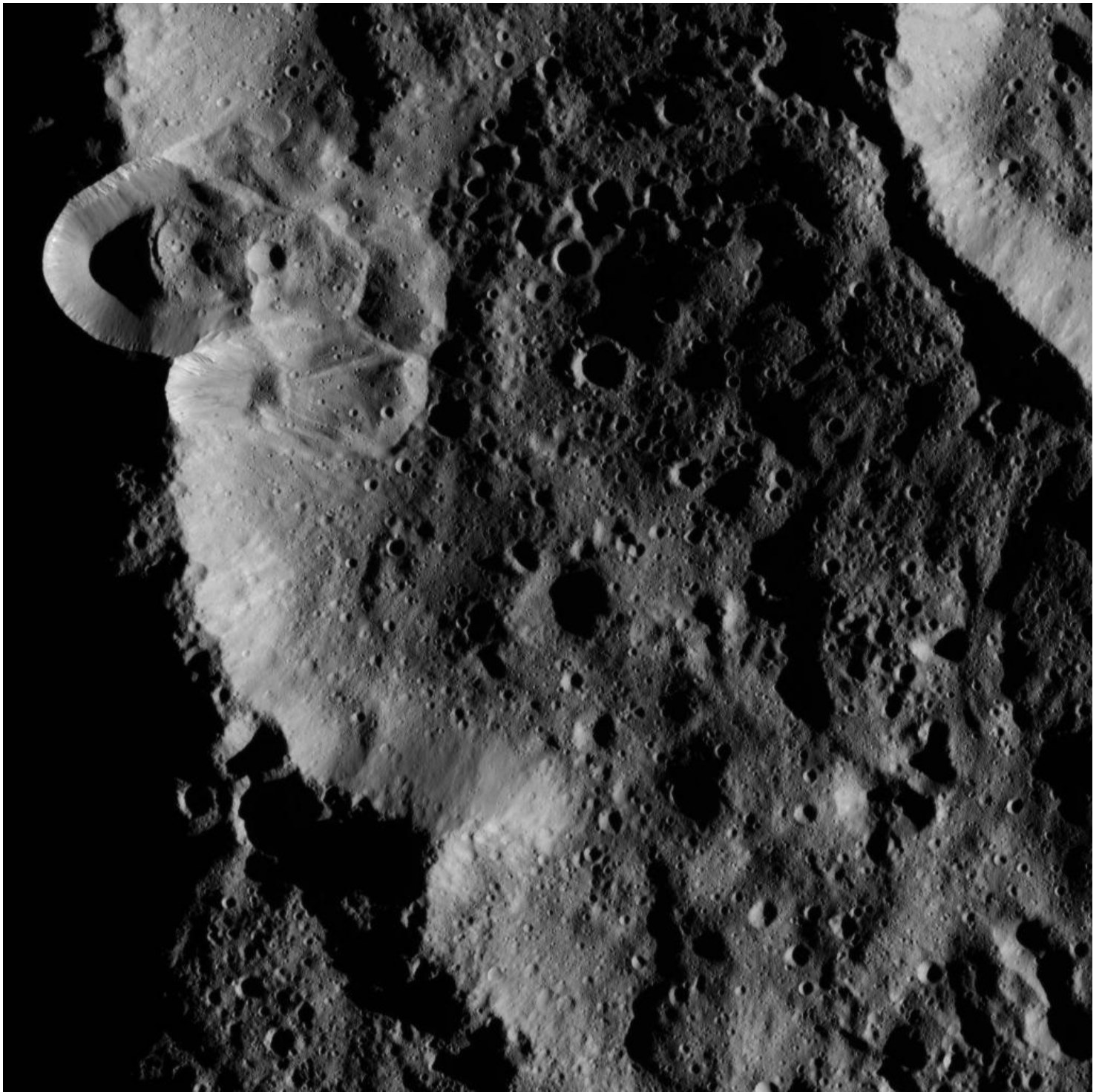
Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



Topographic View of Ceres Mountain

This view, made using images taken by NASA's Dawn spacecraft, features a tall conical mountain on Ceres, with elevations spanning a range of about 5.5 miles (9kilometers) from the lowest places in this region to the highest terrains.

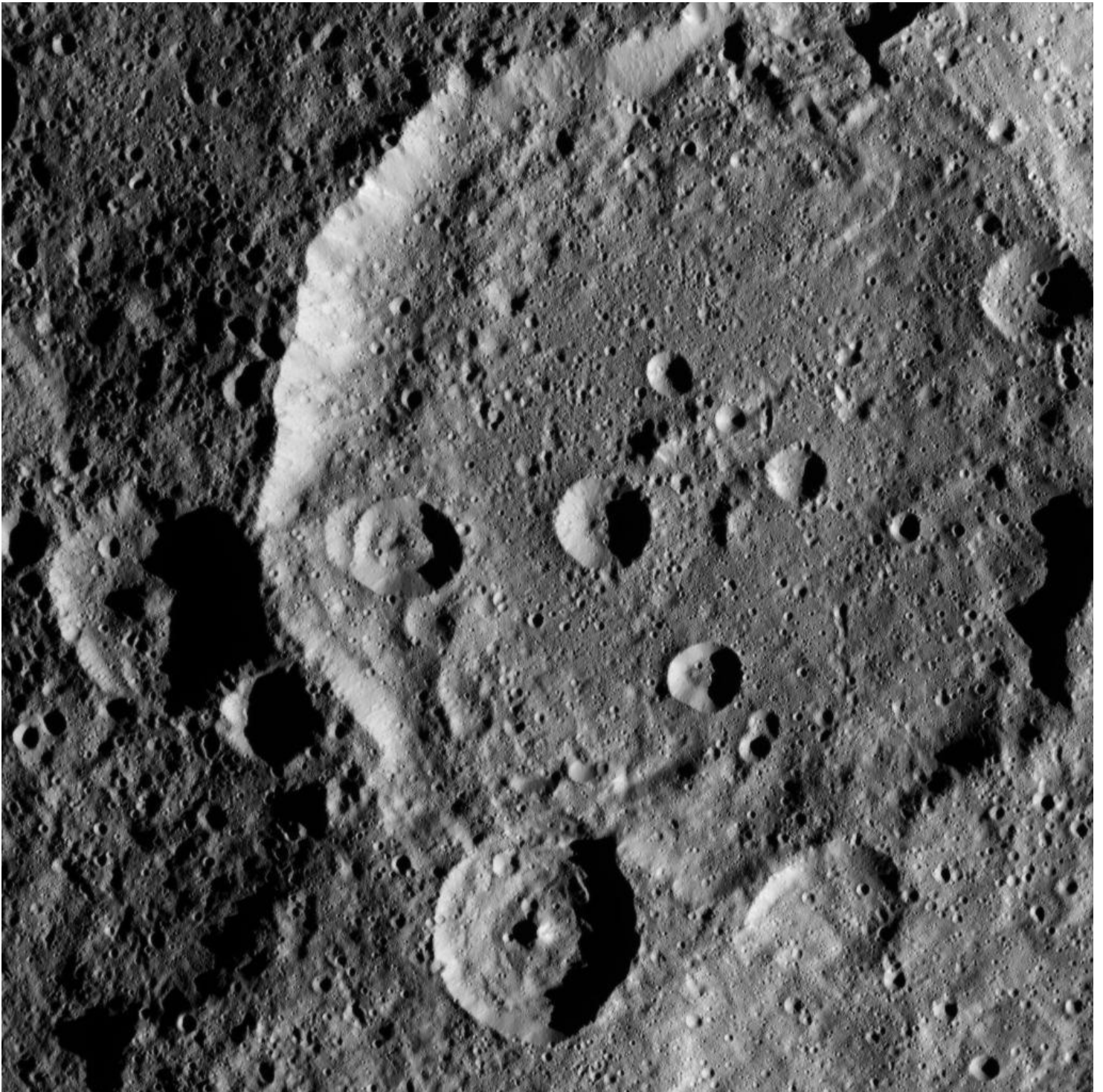
Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



Dawn at Ceres

This image taken by NASA's Dawn spacecraft, shows a portion of the northern hemisphere of dwarf planet Ceres from an altitude of 240 miles (385 kilometers) from the surface.

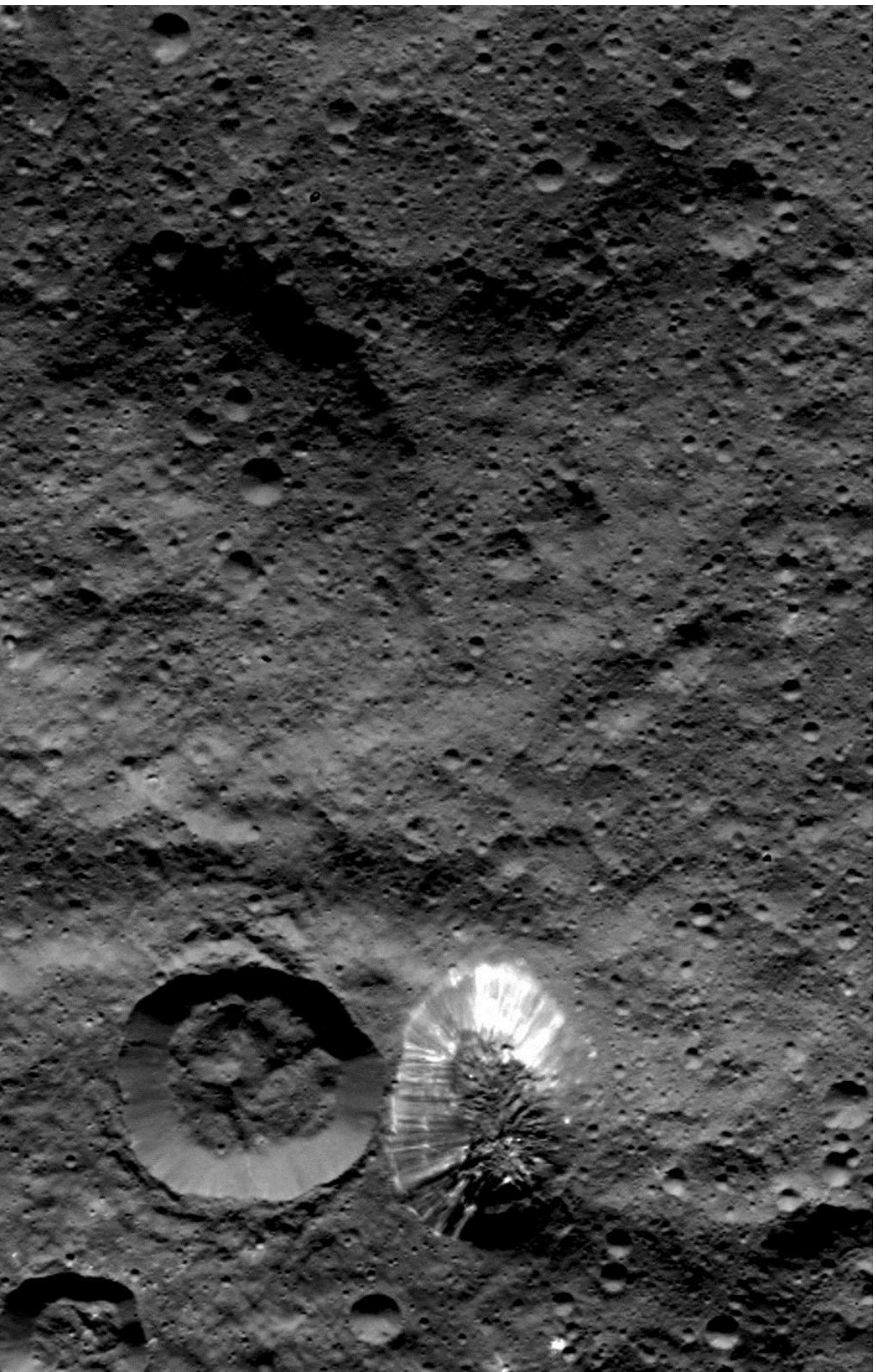
Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



Dawn at Ceres

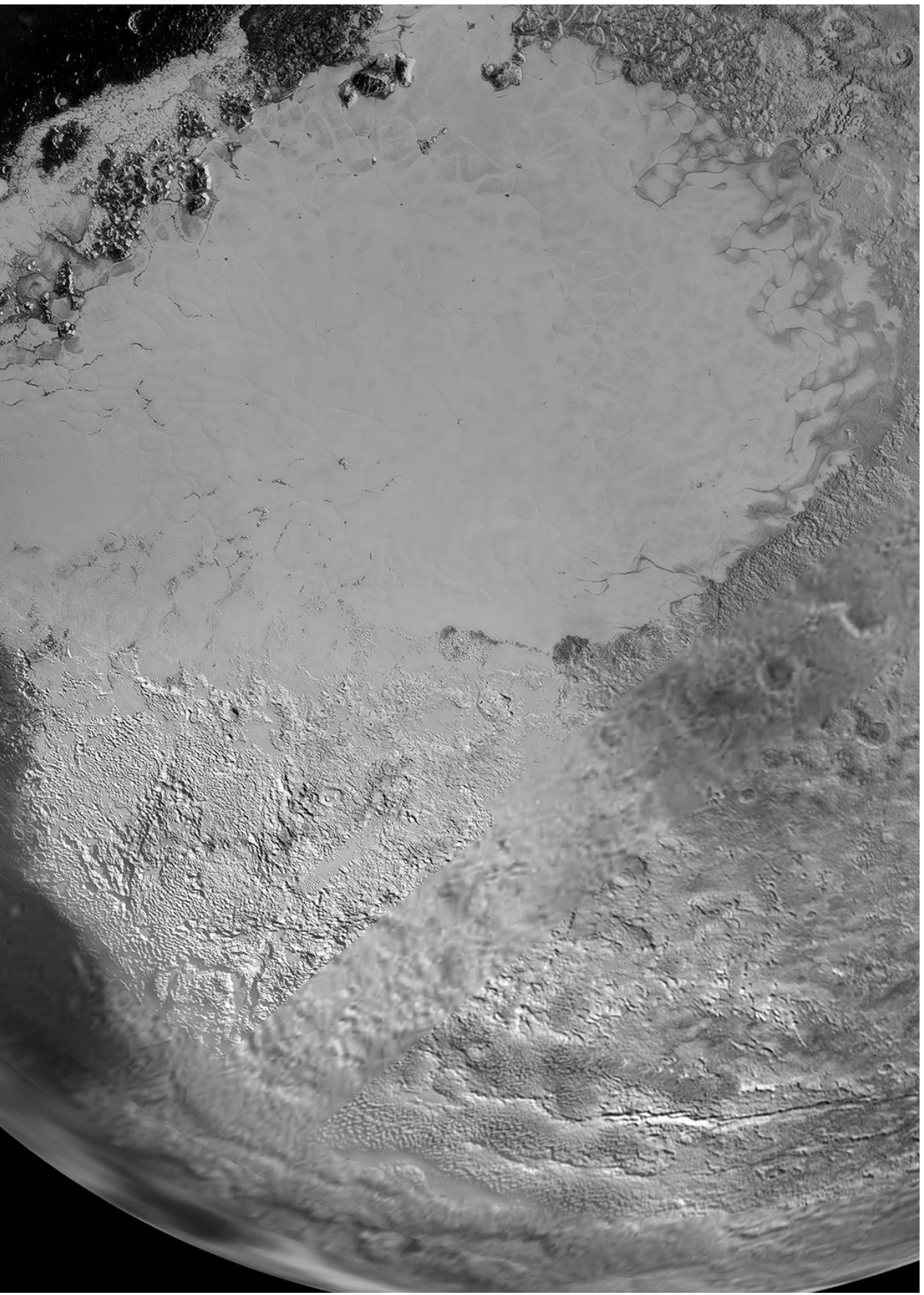
This image taken by NASA's Dawn spacecraft, shows a portion of the southern hemisphere of dwarf planet Ceres from an altitude of 915 miles (1,470 kilometers).

Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



Lonely Mountain on Ceres: Ahuna Mons

Ahuna mons is among the highest features seen on Ceres so far, a mountain about 4 miles (6 kilometers) high, which is roughly the elevation of Mount McKinley in Alaska's Denali National Park. *Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*



Sputnik Planum in Detail

Sputnik Planum is the smooth, light-bulb shaped region on the left of this composite of New Horizons images of Pluto. The brilliantly white upland region to the right may be coated by nitrogen ice transported through the atmosphere from the surface of Sputnik Planum.

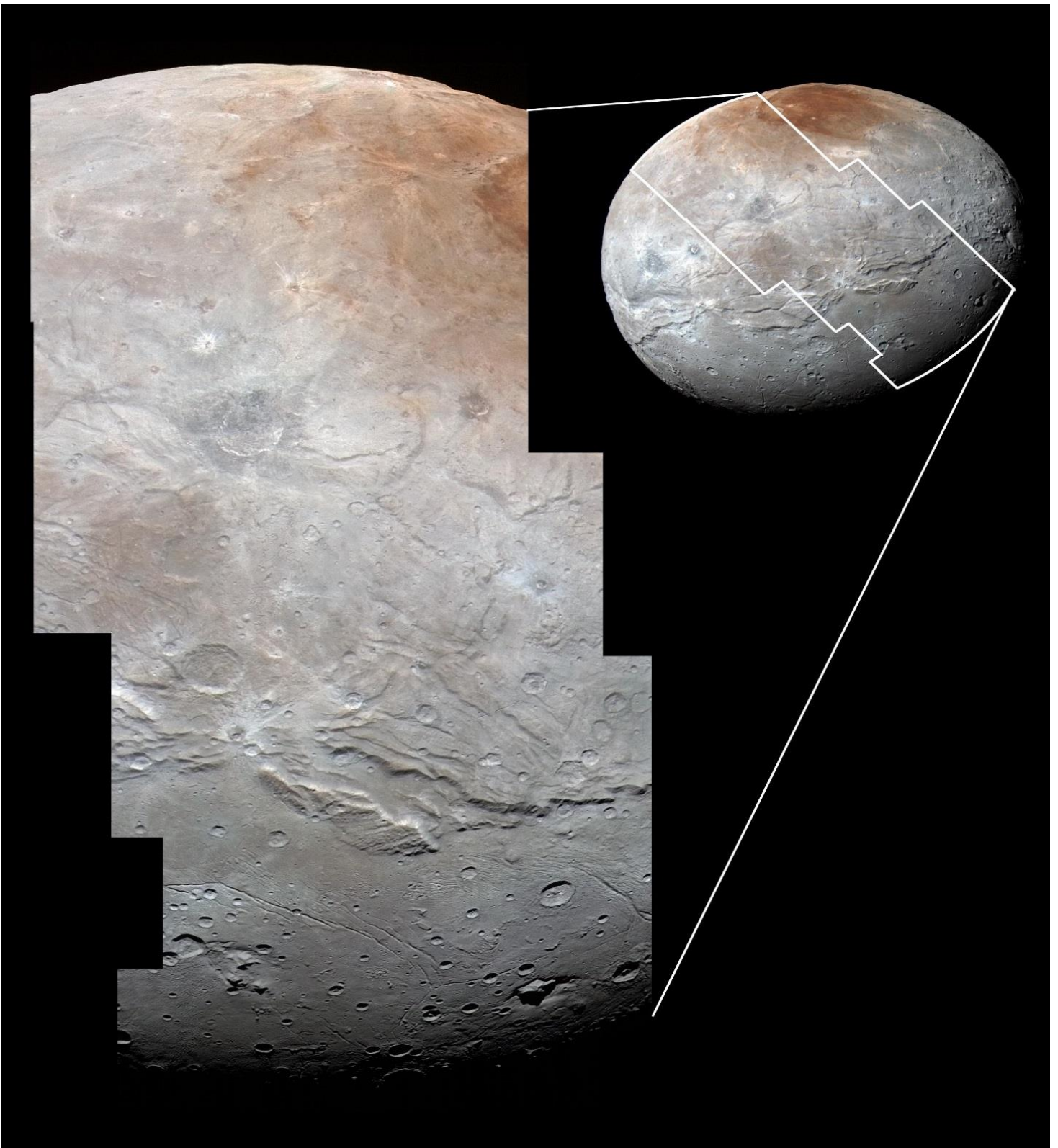
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Closer Look of Pluto's Majestic Mountains and Frozen Plains

15 minutes after its closest approach to Pluto on July 14, 2015, NASA's New Horizons spacecraft looked back toward the sun and captured a near-sunset view of the Sputnik Planum on the right, the rugged Norgay Montes, in the foreground, and the Hillary Montes on the skyline.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Charon in Detail

Charon's cratered uplands at the top are broken by a series of canyons, and replaced on the bottom by the rolling plains, informally named Vulcan Planum.

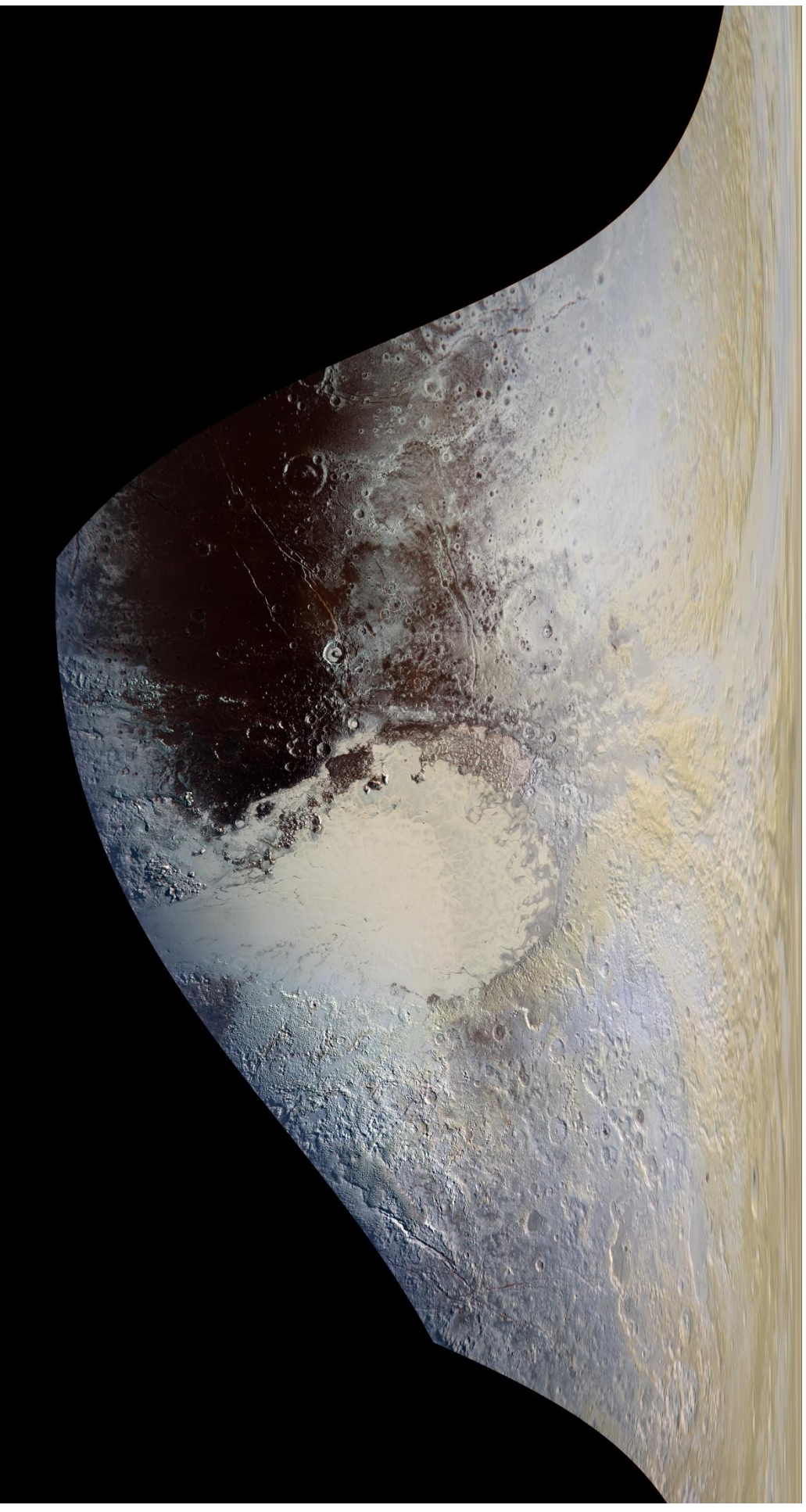
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



'Snakeskin' Terrain

This extended color image of Pluto's bizarrely textured mountains, informally named the Tartarus Dorsa, show intricate patterns of blue-gray ridges and reddish material in between.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Pluto in Extended Color

This cylindrical projection map of Pluto in enhanced, extended color reveals exquisite detail of the subtle differences in terrain. Colors used in this map are the blue, red, and near-infrared filter channels of the Ralph instrument.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Pluto in True Color

Four images from New Horizons' Long Range Reconnaissance Imager (LORRI) were combined with color data from the Ralph instrument to create this global view of Pluto.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Charon in Enhanced Color

NASA's New Horizons captured this high-resolution enhanced color view of Pluto's moon on July 14, 2015. The image combines blue, red, and infrared images taken by the Ralph instrument. The striking reddish feature in the north (top) polar region is informally named Mordor Macula. Charon is 754 mi (1,214 km) across.

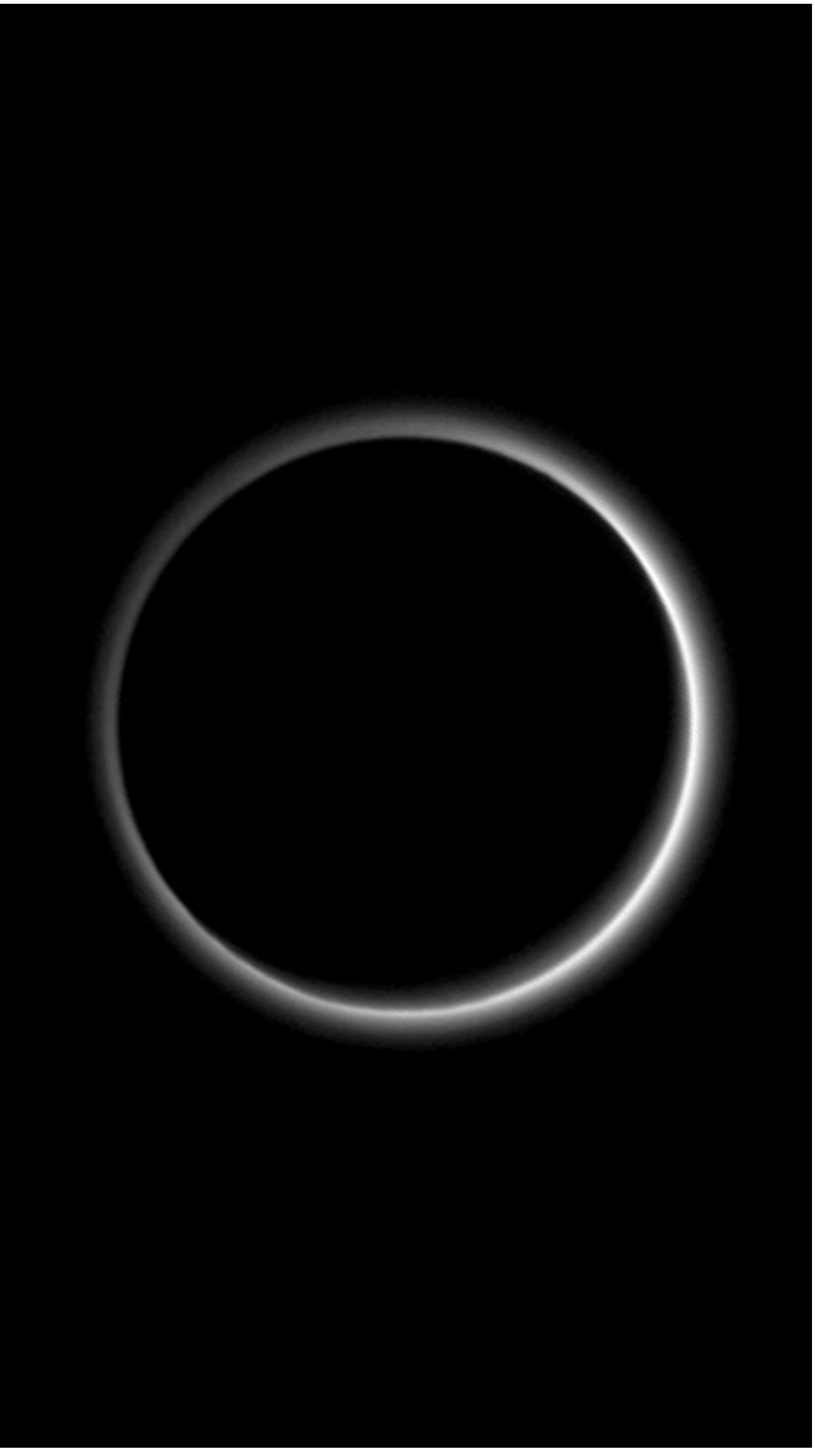
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Charon and Pluto: Strikingly Different Worlds

This composite of enhanced color images of Pluto (lower right) and Pluto's moon Charon (upper left) highlights the similarities of Charon's polar red terrain and Pluto's equatorial red terrain. The relative sizes of Pluto and Charon is correct, but their true separation is not to scale.

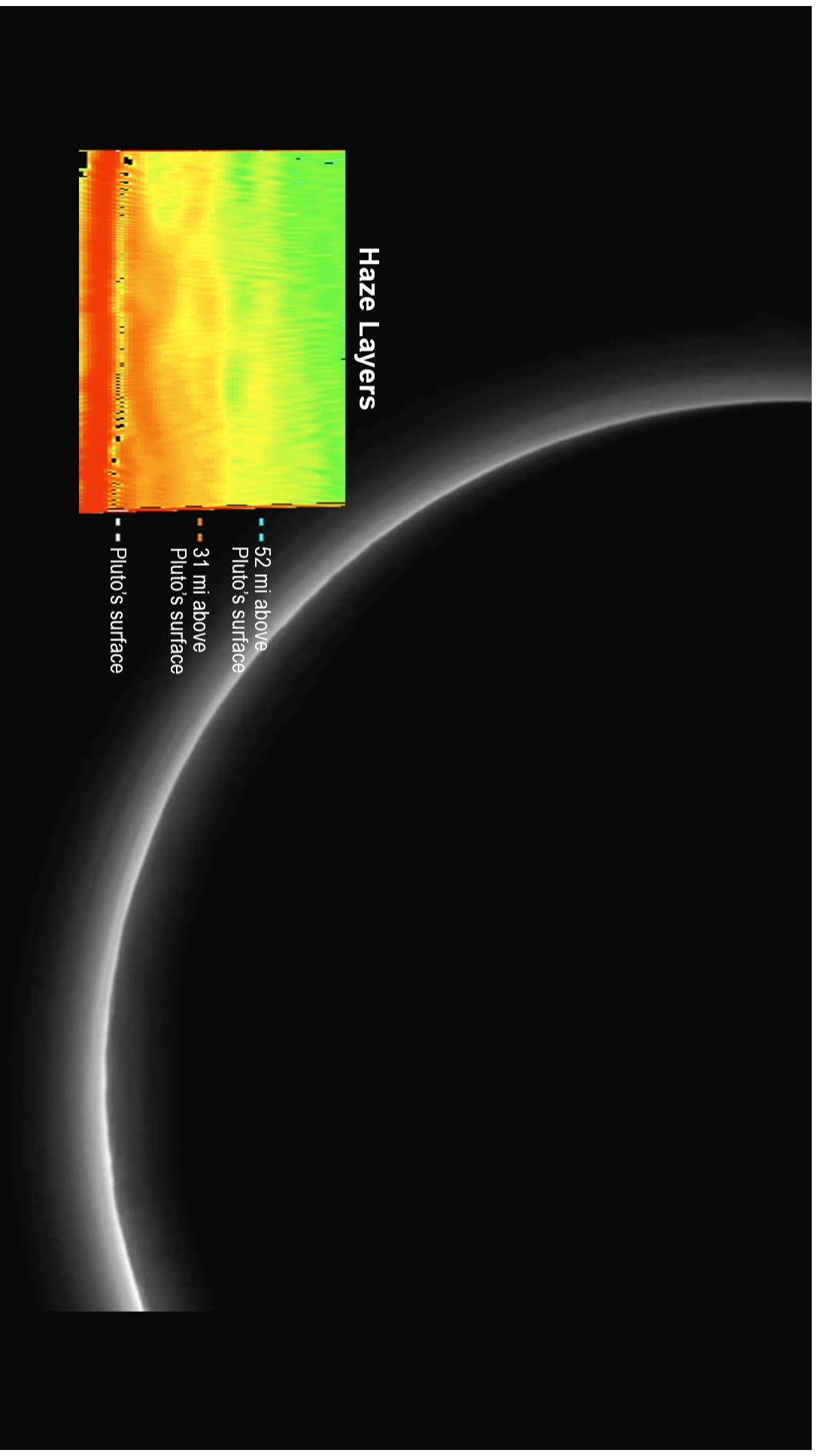
Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Halo Haze Over Pluto

Backlit by the sun, atmospheric haze rings Pluto's silhouette like a luminous halo in the image taken by NASA's New Horizons spacecraft on July 15. This global portrait of the atmosphere was captured when the spacecraft was about 1.25 million miles (2 million kilometers) from Pluto.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Pluto's Layered Hazes

This false-color image of Pluto's hazes reveals a variety of structures, including two distinct layers.

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute